

MEANINGFUL EDUCATION

Tanya Matthew

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Arvind Gupta has had a varied and distinguished career since he did his B. Tech in IIT and worked at TISCO and TELCO. He left this conventional job to join the Hoshangabad Science Teaching Programme (HSTP) initiated by NGO Kishore Bharati. It is here that he began innovating with science experiments using local materials. Later that year he worked with the architect Laurie Baker on a low-cost housing programme for the poor. He returned to TELCO, but left after two years, and this time *never to return*. He says that there were questions in his mind to which he could not find answers as long as his time and energy were taken up by his work. On realizing that he had only "Spartan and austere needs" and that he could "eke out a living anywhere" he decided to quit his job. "In retrospect," he says, "I think it was the right decision."¹ The lakhs of people, especially students and teachers who have benefited from his work will probably *testify to this*.

For the fortunate students and teachers who know of Gupta, his name is synonymous with the toys he makes. He has been involved mainly with the teaching of science to children through these toys. He has popularized it through innumerable workshops that he has conducted for children and teachers, in remote villages and cities, as well as in other parts of the world. He says that making toys has come naturally to him and that even in his childhood he was a "tinkerer." These toys are exceptional because they are created from junk. They are accessible to all children because they can make them on their own, from available and unwanted material ranging from used matchsticks to tetra-packs. By making and playing with these toys, not only do children learn how science is functional in everyday life, but are sensitized to the possibilities that waste material offers. Gupta is known for the *jhola* he carries full of toys that follows him from school to school. His "happiest moments," he says, "are when children show me the toys they have made all by themselves."

Gupta has been working during the past three years at the Children's Science Centre, which is part of Inter University Centre for Astronomy & Astrophysics (IUCAA), Pune. Together with Vidula Mhaskar, a microbiologist, and Ashok Rupner, a grass roots activist, he has conducted around two hundred workshops for children last year. Every workshop accommodates about fifty children who spend the day at the centre making toys, free from the policing gaze of teachers or parents. In around four hours, the children make a dozen or so toys that they are allowed to take home with them. These toys include, for example, a pump to 'pop' a balloon, a simple electric motor, a straw flute, a paper protractor, matchstick models and many others.

For children who have not had the opportunity of attending one of Gupta's workshops, there is always the option of reading about making toys from his books. Most of his books are printed by the National Book Trust and Vigyan Prasar and are cheap and easily available. They can also be downloaded from his website www.arvindguptatoys.com. His first book *Matchstick Models and Other Science Experiments* sold over a million copies and was printed in over twelve Indian languages. He is currently working on a new book on science activities. In *Pumps from the Dump*² he describes several ways of making pumps from easily available, inexpensive material and junk. These range from balloons to hollow papaya stems. The 'Inertia Pump' for instance, can be made from a long hollow tube: a PVC pipe, a hollow papaya or bamboo stem. This pump

squirts water out of a bucket! Since it does not have an inbuilt valve it requires using one's palm as a substitute. The child is therefore able to understand how a valve works when she recreates the effect of the valve herself. In *Matchstick Models and Other Science Experiments* Gupta describes ways of making patterns and three-dimensional figures from matchsticks. This serves as an engrossing way of learning geometry rather than from the boring pages of a textbook.

Gupta also explores how the world of nature can become the source of [unending learning for a child. In *Fun with Seeds*, *Fun with Stones* and *Leaf Zoo*, leaves, seeds and stones become the building blocks for making figures of animals and birds. *Ten Little Fingers* has a section that shows how the same materials may be used to learn about shape, colour and size by grouping them (which is similar to what is done in Montessori schools). In *Ten Little Fingers* he recounts an interesting incident, which occurred when he was working with the Hoshangabad Science Teaching Programme. One of the students forgetting to bring her dissecting needle discovered that a 'Babool' thorn worked perfectly in its place. Gupta says, "This little girl had taught the Science Programme a great lesson."³ Instead of buying the needles that were not available in the village from a nearby town they just needed to look for local materials.

The constant reiteration in most of his books is that children must be allowed to discover and explore the world around them. Parents often get their children toys that are expensive and transfer their apprehension about breaking the toy onto the child by way of a warning. What they do inadvertently is kill the child's natural curiosity and desire to learn about how things work. Most schools perform a similar negative function. Children are taught from uninteresting textbooks from which they are made to learn pieces of information by heart. Gupta says in his book *Little Science*:

Today textbooks have become synonymous with knowledge. Educationists seem to be in a hurry to shovel concentrated doses of knowledge down the throats of children, without bothering whether the children can assimilate them.⁴

When school becomes an unpleasant experience, children can only be persuaded to study through fear or the motivation to do better than their classmates. In such a case there is no real love for the activity, but only a desire to please others. In *Learning Can Be Fun* (co-authored with Sunita Pandhe) Gupta says.

The system of rewards creates an artificial interest in the activity. Children motivated by rewards lose interest in the activity soon after getting the reward.⁵

A Dossier on the Crimes of Schooled Societies and *Learning Can be Fun*, are evidence of his concern for meaningful education in the country. One can see from *A Dossier...* that he lays great importance on the reprinting of educational classics like *Danger: School*, Kuroyanagi's *Totto Chan: The Little Girl at the Window* and Gijubhai Badheka's *Divaswapna*. After all, Laxmiram the protagonist of *Divaswapna* did away with his class's textbooks and started a library with the same money. He hoped that his students' eyes would be opened to a wider and more colourful world than what the textbooks had to offer. "It is a shame," says Gupta, "that no school has built up on this progressive idea."⁶ He adds that Gijubhai practiced what Paulo Freire popularized half a century later, the motto: "not the word but the world."⁷ *Totto-Chan* is the story of a young Japanese girl who is expelled from her school because she does not fit the mould. Her mother however takes her to an unconventional school, which is housed in an abandoned railway carriage. Here students are allowed to learn what interests them most. Some prefer to draw, while others do science experiments. Mr. Kobayashi, the Principal, makes sure that there are activities that suit all children, even a physically handicapped boy. Gupta says he

recounts the stories of *Totto-Chan* and *Divaswapna* in most of his workshops. "The educational soil in our country is barren," says Gupta, "[and] in such harsh conditions even a good seed would wilt." Books like *Divaswapna* and *Totto-Chan* "help create a fistful of soil, and hope for innovative experiments in education to take root."

In the last two years, Gupta and a team comprising Vidula Mhaskar, Arvind Paranjpye and Ashok Rupner have worked hard at digitizing over four hundred books that have been uploaded and are available free for download at www.arvindguptatoys.com. There are several children's books, books on education, science activities, peace and anti-nuke. The team has also got fifty books translated into Marathi, which are also on the website. During the last eighteen months, over thirty thousand people have downloaded books from the website. These books have also been put on a single CD, which they share with teachers from small towns where they do not have easy access to good books. Gupta is jubilant at how "Modern technology enables us to gift a veritable library of four hundred passionate books to a teacher for a measly sum of eight rupees"!

In this competitive age, when children must do exams even in Kindergarten, and seldom have time to play, Gupta is still positive that there will be change. In his visits to various schools, he says he has come across "young minds (of both teachers and students)... thirsty for innovation". Even if the board exams remain the same, he has faith in the power of individuals to make a difference. One has to only turn to Gupta's own life to see the extraordinary contribution that a single person can make through untiring dedication.

Reference

- ¹ Excerpts from an interview with Gupta on email. (All quotations that are not footnoted are from the interview.)
- ² www.arvindguptatoys.com (all books and essays are from the same website, accessed last on 17 September, 2006)
- ³ Gupta, Arvind, *Ten Little Fingers (Pan One)* www.arvindguptatoys.co
- ⁴ Gupta, Arvind, *Little Science* www.arvindguptatoys.com
- ⁵ Gupta, Arvind and Pandhe, Sunita *Learning Can Be Fun* www.arvindguptatoys.com
- ⁶ Gupta, Arvind, *A Dossier on the Crimes of Schooled Societies* www.arvindguptatoys.com
- ⁷ Paulo Freire was a dedicated Brazilian educationalist and author of the classic *Pedagogy of the Oppressed*. This reference to him is also taken from the interview with Gupta.

Tanya Matthew, M.A. English (Previous), St. Stephen's College, Delhi University, Delhi.